

Claims 1, 9 20-24 and 35-39 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lanza et al., in view of Chance. Applicants note with appreciation that claims 2-8, 10-19 and 25-34 were stated to be allowable if rewritten in independent form. Applicants respectfully traverse the above rejection, however, and therefore those claims have been retained in dependent form at this time.

The Examiner referred to language in the Lanza et al. reference at column 3, line 66 through column 4, line 12 and column 5, line 30 through column 8, line 4 as disclosing measuring “the bone radius from a projection image with edge detection analysis to determine the radius (half of diameter and circumference is a function of radius or diameter)”. Applicants are unable to find any statements in the Lanza et al. reference in the passages noted by the Examiner, or in any other portion of the Lanza et al. reference, wherein the radius of a bone or a joint is determined. The Lanza et al. reference is for the purpose of determining bone *density*, and as far as Applicants are able to discern from reading the entirety of the Lanza et al. reference, there is no discussion of identifying a radius or a diameter of a bone or a joint. In fact, the Lanza et al. reference makes explicitly clear, as shown in Figures 7D and 7E, that the regions that are analyzed for determining bone density are *rectangular* regions, such as regions 32 and 33.

Applicants note that the Lanza et al. reference at numerous locations uses the word “radius,” however, the usage of this word in the Lanza et al. reference does not refer to the geometrical radius of a circle, but is the name of the radius bone, which forms one of the principal bones in the arm, together with the ulna.

Moreover, as noted above, the Lanza et al. reference is concerned with making measurements of bones and deriving a bone density value therefrom. This

is not the same as making a measurement of a digit and then determining the circumference of the digit therefrom. The most that can be said of the Lanza et al. reference is that it teaches the use of edge detection of *bone images*, but the skin and surrounding tissue do not enter at all into any of the calculations in Lanza et al., because the surrounding tissue has nothing to do with the bone density value, which is ultimately to be determined in the Lanza et al. reference. By contrast, for measuring the progress of arthritis, it is important to have a measurement of the exterior of the digit, not just a measurement of the bones therein.

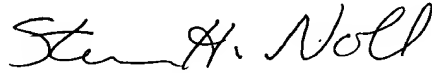
For this reason, even if the Lanza et al. reference were modified in accordance with the teachings of Chance, a method and apparatus as disclosed and claimed in the present application still would not result. The Examiner acknowledged that the Lanza et al. reference does not disclose the use of making a light measurement. The reason why a light measurement is not used in the Lanza et al. reference should be clear from the above discussion. The light measurement in the Chance reference is a *spectroscopic* measurement, and is not a measurement of any physical dimension of a subject. There is no "image" obtained by means of light in the Chance reference; the absorption of the light at different wavelengths is simply analyzed for the purpose of making spectroscopic conclusions regarding the tissue through which the light has been transmitted. Clearly this has nothing whatsoever to do with the bone density measurements made in the Lanza et al. reference, which require edge detection of the bone. It is doubtful whether a clear or accurate detection of bone within tissue can even be made by light measurements of the type described in the Chance reference, even if the teachings of Chance to use the detected light for making a spectroscopic measurement are completely ignored.

If the Examiner believes that a light source could simply be substituted for the radiation source 112 in the Lanza et al. reference, based on the teachings of Chance or based on the teachings of any other reference, the Examiner is requested to provide evidence as to how the Examiner believes a usable image of the bone could be obtained, as is essential for the intended operation of the Lanza et al. reference. Even if this could be accomplished, as noted above this is not the same as obtaining an image of the surrounding tissue, which is what is necessary for the purpose of determining the circumference of a digit. If light were used having an intensity sufficient to generate an image of a bone inside of tissue, this would undoubtedly result in the surrounding tissue not showing up at all in the resulting image, thereby making such an image useless for the purpose of determining the circumference of a digit.

Applicants therefore respectfully submit that even if the Lanza et al. reference were modified in accordance with the teachings of Chance, the most that would result is augmentation of the radiation image in the Lanza et al. reference with a spectroscopic measurement as taught by Chance, which clearly is not even remotely close to the subject matter of the claims of the present application. No claim of the present application, therefore, would have been obvious to a person of ordinary skill in the field of designing systems for arthritis evaluation, based on the teachings of Lanza et al. and Chance.

All claims of the application are therefore submitted to be in condition for allowance, and early reconsideration of the application is respectfully requested.

Submitted by,



(Reg. 28,982)

SCHIFF, HARDIN LLP
CUSTOMER NO. 26574
Patent Department
6600 Sears Tower
233 South Wacker Drive
Chicago, Illinois 60606
Telephone: 312/258-5790
Attorneys for Applicants.

CH1\ 4292333.1